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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/611,159	07/06/2000	Akihiro Tominaga	KOIK-T0840	5460
29175	7590	02/12/2004	EXAMINER	
BELL, BOYD & LLOYD, LLC P. O. BOX 1135 CHICAGO, IL 60690-1135			CHANG, JUNGWON	
			ART UNIT	PAPER NUMBER
			2154	8

DATE MAILED: 02/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Page

Office Action Summary

Application No.

09/611,159

Applicant(s)

TOMINAGA ET AL.

Examiner

Jungwon Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1-24 are presented for examination.
2. It is noted that the present application does not contain line numbers in the specification and claims. The line number in the claims has a preferred format that is to number each line of every claim, with each claim beginning with line 1. For ease of reference by both the examiner and applicant all future correspondence should include the recommended line numbering.
3. This Office action has an attached requirement for information under 37 C.F.R. § 1.105. A complete response to this Office action must include a complete response to the attached requirement for information. The time period for reply to the attached requirement coincides with the time period for reply to this Office action.

In response to this requirement, please provide a copy of each of the following items of art referred to in the specification on page 9, lines 8-18.

4. The disclosure is objected to because of the following informalities:
On page 4, line 11, the phrase "structure o the Internet" should be "structure of the Internet".
On page 43, line 12 – page 44, line 3, the term "servered" should be "served".
Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. There is insufficient antecedent basis for this limitation in the claim.

i. said computer program – claim 19, line 2

b. The claim language in the following claims is not clearly understood:

i. As to claim 1, the term “indefinite addresses” is unclear (i.e., is it intended to mean that dynamic addresses?);

ii. Line 8, it is not clear what is meant by “outside” (i.e., outside network?);

iii. Lines 1-13, the term “representative server” does not adequately describe the relationship between the lower order server or upper order server;

iv. Line 11, it is uncertain whether “an upper order server” refers to “an upper order server” in line 4 (i.e., if they are the same, then it should be indicated by use of the word ---said---);

v. Line 12, it is uncertain whether “an address block” refers to “an address block” in line 10 (i.e., if they are the same, then it should be

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indicated by use of the word ---said---);

vi. Line 12, it is not clear the representative server distributing an address block to whom (i.e., who or what is receiving the address block from the representative server?);

vii. As to claim 6, line 2, it is not clear what each server is being referred to, i.e., upper order server? lower order server? representative server?;

vii. As to claim 19, line 1, it is not clearly understood what is meant by "transmitting a computer over a wire" (i.e., transmitting a computer program?);

viii. As to claims 7, 13 and 19, they have the same deficiency as claim 1 as set forth in the paragraph above.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-5, 7-11, 13-17 and 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bahlmann (US 6,578,074 B1), in view of "Official Notice".

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9. As to claims 1 and 7, Bahlmann discloses the invention substantially as claimed, including an automatic address management method in a system-wide network (110, fig. 1) made up of fixed addresses having a static already allocated interconnection and indefinite addresses (col. 6, lines 19-24), in which an upper-lower order relation (fig. 8, col. 10, lines 30-43) is established such that an upper order server allocates an address block to a lower order server (col. 5, lines 53-58) and the lower order returns the address block to the upper order server (col. 6, lines 12-17), said method comprises:

(a) a step in which a representative server (214, 215, fig. 1) with a link to outside contained (col. 10, lines 44-52; col. 3, lines 40-46); and

(b) a step in which said representative server requests allocation of an address block to an upper order server supervising said segment (col. 5, lines 53-58; col. 8, lines 37-45).

10. Bahlmann discloses static address allocation and dynamic address allocation (col. 6, lines 19-24). However, Bahlmann does not specifically disclose static address and dynamic address are stored in core portion and the terminal portion respectively. "Official Notice" is taken that both the concept and advantages of providing for storing the addresses in terminal portion and the core portion is well known and expected in the art. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include terminal and core portions because it would improve fast access by allowing the server to retrieve data stored therein.

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Bahlmann discloses representative server (i.e., gateway or router; 214, 215, fig. 1) has a function to receive or distribute network address, such as an address in IP protocol, based on user requests. However, Bahlmann does not specifically disclose said representative server distributes an address block in said terminal portion. "Official Notice" is taken that both the concept and advantages of providing for storing the addresses in terminal portion and the core portion is well known and expected in the art. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include distributing an address block because doing so would allow a user to communicate with outside network using the unique IP address.

11. As to claims 2 and 3, Bahlmann discloses representative server requests connection using an already known address owned by an upper order server of said segment (col. 11, lines 44-48).

12. As to claim 4, Bahlmann discloses DHCP (Dynamic Host Configuration Protocol) or IPCP (Internet Protocol Control Protocol) (col. 4, lines 52-58).

13. As to claim 5, Bahlmann discloses if an upper order server receiving an address block allocation request does not own a sufficient address pool, an address block allocation request is recursively issue to a further upper order server (fig. 8; col. 10, lines 30-43).

14. As to claim 13, it is rejected for the same reasons set forth in claims 1 and

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7 above. In addition, Bahlmann discloses program furnishing medium for furnishing a computer program in a tangible and computer-readable form (200, 208, 210, 212, fig. 2; col. 5, lines 25-39; col. 9, lines 46-60).

15. As to claim 19, it is rejected for the same reasons set forth in claims 1, 7 and 13 above. In addition, Bahlmann discloses a program transmitting signal for transmitting a computer program over a wire or a radio path (col. 5, lines 1-15).

16. As to claims 8, 9, 14, 15, 20 and 21, they are rejected for the same reasons set forth in claims 2 and 3 above.

17. As to claims 10, 16 and 22, they are rejected for the same reasons set forth in claim 4 above.

18. As to claims 11, 17 and 23, they are rejected for the same reasons set forth in claim 5 above.

19. Claims 6, 12, 18, and 24 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

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20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Martin et al, patent 6,614,788 B1, Joong, patent 6,549,776 B1, Inoue et al, patent 6,515,974 B1, Burgaleta Salinas et al, patent 6,469,998 B1, Sitaraman et al, patent 6,427,174 B1, Wirkestrand, patent 6,408,339, Wong, patent 6,073,178, Subramaniam et al, patent 6,070,187 disclose a method and apparatus for assignment of IP addresses with Dynamic Host Configuration Protocol.

Tominaga et al, "Problems and Solutions of DHCP", Proc. INET 1995.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jungwon Chang whose telephone number is (703)305-9669. The examiner can normally be reached on 9:30-6:00 (Monday-Friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John A Follansbee can be reached on (703)305-8498. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair->

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direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jungwon Chang
February 4, 2004



JOHN FOLLANSBEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

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Requirement for Information Under 37 C.F.R. 1.105

Applicant and the assignee of this application are required under 37 CFR 1.105 to provide the following information that the examiner has determined is reasonably necessary to the examination of this application.

In response to this requirement, please provide the citation and a copy of each publication which any of the Applicants authored or co-authored and which describe the disclosed subject matter of obtaining securities information and transactions for a user at an automatic teller machine.

In response to this requirement, please provide the names of any products or services that have incorporated the claimed subject matter and the disclosed prior art of obtaining securities information and transactions for a user at an automatic teller machine.

The fee and certification requirements of 37 C.F.R. 1.97 are waived for those documents submitted in reply to this requirement. This waiver extends only to those documents within the scope of this requirement under 37 C.F.R. 1.105 that are included in the applicant's first complete communication responding to this requirement. Any supplemental replies subsequent to the first communication responding to this requirement and any information disclosures beyond the scope of this requirement under 37 C.F.R. 1.105 are subject to the fee and certification requirements of 37 C.F.R. 1.97.

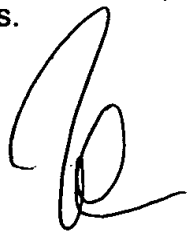
In responding to those requirements that require copies of documents, where the document is a bound text or a single article over 50 pages, the

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requirement may be met by providing copies of those pages that provide the particular subject matter indicated in the requirement, or where such subject matter is not indicated, the subject matter found in Applicant's disclosure.

The Applicant is reminded that the reply to this requirement must be made with candor and good faith under 37 CFR 1.56. Where the Applicant does not have or cannot readily obtain an item of required information, a statement that the item is unknown or cannot be readily obtained will be accepted as a complete response to the requirement for that item.

This requirement is an attachment of the enclosed Office action. A complete response to the enclosed Office action must include a complete response to this requirement. The time period for reply to this requirement coincides with the time period for reply to the enclosed Office action, which is THREE months.



JOHN FOLLANSBEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

Network and Application Engineering **INTERNET****N2: Routing and Addressing**

Problems and Solutions of Dynamic Host Configuration Protocol (DHCP)

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Abstract

1. Introduction

Dynamic Host Configuration Protocol (DHCP)[RFC1541] is a client-server type protocol for dynamic IP address assignment and network parameters notification. We implemented DHCP from scratch and started test operation in March 1994 in the WIDE project, a research project in Japan. Although it is very convenient to use DHCP in a mobile computing environment, some problems of DHCP were found through the test operation. Some of them can be solved by modifying the specification of DHCP. However, it is required to develop a new protocol to solve others. This paper makes problems of DHCP clear, proposes their solutions, and discusses requirements for a new host configuration protocol.

2. DHCP Implementation in the WIDE Project.

Our goals of DHCP implementation are as follows:

- A. Major operating systems should be supported.
- B. Implementation should be independent of operating systems.
- C. The source code should be distributed freely.

Our implementation includes all the modules of DHCP, i.e., the server, the client, and the relay-agent. These modules are implemented as application processes with Berkeley Packet Filter in BSD UNIX as well as Network Interface Tap in SunOS. At the end of 1994, our implementation is running on BSD/386, NEWS-OS, SunOS, and FreeBSD. We plan to distribute our source code freely.

3. Problems and Solutions

The test operation of DHCP found some important problems on complexity, fault tolerance, scalability, and reliability as follows:

- A. The state transition in the client is too complex.
- B. The client cannot continue to use the assigned address when the server fails.
- C. The server cannot control the client.
- D. Low scalability.
- E. There is no ack for DHCPRELEASE.

Problem A means that the protocol is heavy. This makes it hard to implement the client in an operating system kernel or on a single task operating system. Especially, the state transition becomes tremendously complex if the client simultaneously verifies and extends the address lease time. In short, algorithm about retransmission in the specification restricts the timing of verification. Thus, it is necessary to make the algorithms independent of implementation to solve this problem. Other solution is that the server periodically asks the client for lease extension. The client sleeps till an inquiry comes, or verifies at any moment. A disadvantage of this solution is that the processing load of the server increases. In addition, it requires changes of address management strategy of DHCP. Therefore, it is more desirable to develop a new protocol than to change the specification of DHCP.

Problem B means that there is no fault-tolerance with DHCP server. In DHCP, the client explicitly sends a request for lease extension. Therefore if the server or communication path between the server and the client fails, the client cannot extend its lease and must suspend the use of the IP address. To solve this problem, distributed management with multiple servers is considered in the DHCP-WG of IETF. However, since DHCP servers update their databases frequently, it is very hard to maintain the consistency among these databases. Currently, there is still no prospect to achieve this mechanism.

Essentially, it is very difficult to solve this problem as long as the server strictly manages address assignment. It is more efficient to change the protocol to make the client work autonomously. Like the solution for Problem A, it is necessary to develop a new protocol. Problem C is a big disadvantage. For example, the server can neither recall assigned addresses nor notify information changes. It is necessary to add a new message type to solve this problem. Problem D; Suppose that many clients begin boot all at once, such as after power failure. The current DHCP has a little consideration, but it is not enough to support hundreds of clients. The mechanism is required to send many DHCP OFFER, DHCP ACK or DHCP NAK together. The last problem E is trivial. DHCP does not guarantee reliable address release. It affects expandability of DHCP. It can be solved by adding a new message type.

4. Summary

In conclusion, the following first three problems can be solved by extending the protocol of DHCP. This paper will describe some improvements on DHCP including actual message format. On the other hand, the following last two problems need to define an entirely new protocol. This paper will also discuss the requirements for the new protocol.

- a. There is no message to control the client by the server.
- b. There is few consideration about scalability.
- c. DHCPRELEASE doesn't have corresponding acknowledgment.
- d. The complexity of state transition of the client.
- e. The weakness for the server failure.

References

Droms, R.: Dynamic Host Configuration Protocol, RFC1541, October 1993.

Droms, R.: Dynamic Host Configuration Protocol, draft-ietf-dhc-dhcp-00.txt, November 1994.

Wimer, W.: Clarifications and Extensions for the Bootstrap Protocol, RFC1542, October 1993.

Alexander, S. and Droms, R.: DHCP Options and BOOTP Vendor Extensions, RFC1533, October 1993.

Droms, R.: Interoperation Between DHCP and BOOTP, RFC1534, October 1993.

[\[Archives\]](#)